

UNITED STATES GOVERNMENT
MEMORANDUM

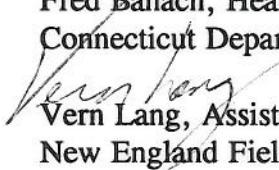
U.S. FISH AND WILDLIFE SERVICE

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TO: Jeanne Voorhees, Connecticut Unit,
EPA Region I

May 30, 2000

Fred Banach, Hearing Officer
Connecticut Department of Environmental Protection

FROM:  Vern Lang, Assistant Supervisor
New England Field Office

JUN 02 2000

STATE PROGRAM UNIT

SUBJECT: Connecticut Water Quality Standards

In accordance with your April 6, 2000 Memorandum, I have developed the following questions and comments on Connecticut's existing and proposed standards. My comments follow the format of the proposed standards and will need to be read in conjunction with them since I did not redraft each section.

I. Definitions

The Connecticut water quality standards contain a substantial number of defined terms. Despite these numbers, a few terms that appear frequently in state water quality standards are missing. These include terms such as pollutant, pollution, reference site/reference condition, aquatic life, mixing zone and biological integrity. It would be useful if these were included as defined terms similar to the standards of other New England States.

Zone of Influence - It would be useful to clarify the relationship of the zone of influence to a mixing zone (zone of initial mixing) and describe the temporal and spatial limitations that apply to the impairment of use contained in the existing definition. Also, does this impairment allowance apply equally to designated and existing uses and to all water quality parameters?

II Surface Water Quality Standards

- ✓ 1. I recommend that this standard be made consistent with the national goal to restore and maintain the chemical, physical and biological integrity of the nations waters contained in section 101(a) of the Clean Water Act and the interim goal contained in section 101(a)(2). As presently constructed, Connecticut's goal is somewhat less ambitious than the national goal. Connecticut's goal is to restore and maintain existing and designated uses. It is not clear how this compares to the interim goal in the CWA regarding the protection and propagation of fish, shellfish and wildlife. None of the designated use goals for the

various water classes include the section 101(a) goals. Consequently, the standards do not contain a restoration use goal, e.g., section 101(a) nor a mechanism to attain and maintain the ultimate national goal, e.g., a classification or use designation. The standards, classifications and criteria in Connecticut's water quality standards reflect this significant difference in use goals.

3. High quality waters are restricted to Class B or SB and higher. Is it not possible that some Class C or SC waters could have certain water quality parameters, e.g., flow, dissolved oxygen, nutrients, etc. that would be considered to be high quality on a parameter by parameter basis? I suggest that changes be made in the antidegradation policy to provide for a parameter by parameter approach and that the definition of high quality water be modified to accommodate such an approach.
4. Is this antidegradation standard for high quality waters applied in addition to standard 3 in all cases or in lieu of standard 3 for "insignificant" discharges? The last sentence seems to imply the latter where BMP's are prescribed for point and nonpoint sources. It would seem that point source discharges including dredged or fill materials would be controlled in the typical antidegradation Tier II review process. However, the last sentence implies that they would be controlled with nonpoint mechanisms such as BMP's. The ambiguity pertaining to minimum requirements for discharges other than NPDES discharges and for activities needs to be eliminated.
8. The statement that water quality criteria do not apply to conditions brought about by natural causes is perplexing. The majority of conditions in water, e.g., flow, temperature, dissolved oxygen are caused by natural events. If the intent is to exempt certain extreme natural events or occurrences, the section should be modified to state this more precisely. This section also modifies the meaning of the word natural to include cultural influences from man's use of the land. By extension, would this imply that any natural reference site would also be influenced by cultural factors thereby frustrating any attempt to achieve restoration of the chemical, physical and biological integrity of water? If so, the cultural influence modification should be eliminated such that natural means natural, e.g., free from any cultural or other influence by man.
9. A. This section has been modified to include dredging activity and the discharge of dredged or fill material as allowable activities in Class AA, A and SA waters. Does this mean that dredge material from a Class SB or SC water can be disposed in SA waters? The proposed deletion of the word "other" in the first sentence changes the meaning of the sentence and suggests that the quality of dredged or fill material may be subject to unspecified cultural influences. Also, it is not clear why Connecticut would encourage the discharge of dredged or fill material into AA, A and SA waters since these are high quality waters and they should be protected from these activities or at the least, these activities should be restricted by water quality criteria and the state's antidegradation policy. As a minimum for dredged material disposal, a requisite in the standards should be that the material be

dredged from the same or higher classification of waters as the disposal site and that these waters where dredging occurs fully meet the standards of its classification before disposal could be allowed into waters with an equal classification.

10. This section provides for the establishment of a zone of influence for mixing and assimilation of a discharge. What is not clear is whether the zone of influence is the same as a traditional mixing zone where initial mixing occurs or if it also includes an assimilation zone somewhat comparable to the waste management zone in Vermont. If the latter, it would appear that a much larger proportion of waters would be without protection from the water quality criteria than if the former interpretation is correct. Normally, water quality standards must be met at the edge of the mixing zone, not at the downstream end of a D.O. or other assimilation zone or waste management zone.

It is not clear if the zone of influence would or would not preclude the attainment of existing or designated uses inside the zone of influence? Line 7 of the standard speaks to the receiving surface waters not the zone of influence itself. This ambiguity should be eliminated.

A criterion should be added to state that no lethality may occur to an organism passing through a mixing zone or mixing zone portion of the zone of influence. This should not be listed as a discretionary issue to consider as in the case of subsection 10.B, but should be a mandatory criteria. Likewise, mixing zones should be cited so as to avoid spawning and nursery grounds and other ecologically sensitive areas not merely considered as discretionary as in subsection 10.C.

11. This standard establishes 7Q10 and other similar low flows as the absolute low flow condition at which these standards apply. Missing here or as a separate standard is a narrative and/or numeric flow standard sufficient to maintain and protect the full life cycle and functions of aquatic life and wildlife as well as existing and designated uses. The Services' New England Flow Policy is recommended as an adequate instream flow procedure for inclusion into these water quality standards as a separate instream flow standard or criterion.
12. Suggest adding the words "or activities" after the word discharges on line 3 to make the standard more consistent with case law and subsection 12(A). On line 4 insert the words "and wildlife" after the words "marine life" to help ensure consistency with CWA goals.

At the end of subsection (A) add the phrase "and other narrative and numeric criteria and standards in these water quality standards". This addition would be useful because biological communities can be impaired by a variety of pollution sources not just toxins.

Suggest adding a new criterion for subsection 12(B) to address section 101(a) of the Clean Water Act:

(B)4. The proposed site-specific criteria for the waters subject to the request are sufficiently stringent to protect all life cycle functions and life stages of aquatic life and wildlife at a reference site free from point and nonpoint source discharges and other cultural influences.

13. Suggest amending line 3 of this revised standard by including a reference to new paragraph (4) of standard 12(B) above. Also delete the word "and" after the comma on the last line of the revised standard and insert the following phrase at the end of the sentence " and aquatic life and wildlife expected to occur in the waters without point and nonpoint source discharges and other cultural influences are fully protected".
14. Suggest deleting the following language on line 4 from this standard "dredged material disposal area or areas designated by the Commissioner for disposal or placement of fill materials or any zone of influence". In place of this language, I suggest adding the words "mixing zone" to replace zone of influence.

On line 9 of this standard, I recommend insertion of a period after the word "wildlife" and deletion of the remainder of this sentence, e.g., the proposed addition starting with the word "unless" and ending with the word "writing".

The existing and proposed language would create exceptions from the requirement to protect aquatic life from acute or chronic toxicity except within specified mixing zones (zones of initial dilution and mixing). In this instance, Connecticut is proposing a zone of influence which may or may not be the same as a mixing zone. Disposal areas for dredged and fill materials could have mixing zones for the initial disposal phase wherein the material descends through the water column to the bed of the waterbody. However, once the material reaches the bottom of the disposal or fill site, the initial mixing phase is over and a mixing zone is no longer appropriate since it would serve as a permanent exemption from the free from provisions. Discharges of dredged or fill material are inherently different from the typical NPDES waste discharges in that they occur on an episodic or sporadic basis, their life span in the water column is short and their resting phase causes long-term or permanent changes in the elevation of the bottom of the receiving water. As proposed in this standard, the mixing zone concept would serve to mask or cover up potential acute, or chronic toxicity and bioaccumulation pollution problems associated with dredged material disposal sites, fill sites, and those portions of zones of influence that exceed the limits of ordinary mixing zones. Mixing zones for dredged or fill materials should be limited only to the descent phase of the discharge activity. Also, see discussion on standard 15 below.

15. I recommend deleting the material on lines 1,2,3 and 4 ending with the bracketed numbers 22a-32]. The standard should begin with the words "surface waters and bottom sediments...." This change is necessary to eliminate the exception for dredged and fill areas from complying with the free from narrative criteria of this standard.

On line 4 of this standard, I recommend deletion of the word "substantially" because it imparts an unnecessary degree of subjectivity to the sentence which already suffers from an over abundance of imprecise words.

Standard 15(C) should be modified by deleting the word "contaminated" on line 11. By including the word contaminated as proposed, the Department would create an exception from subsection a) in this standard to keep bottom sediments free from toxic pollutants both inside and outside dredged material disposal areas. I believe it would be acceptable to craft an exception in this subsection for discharges of clean dredge material at designated dispersal sites.

I recommend that the last sentence in standard 15 be deleted for the foregoing reasons and because the practice of capping dredge material cannot ensure consistency with this standard. Dredged materials frequently remain exposed at disposal sites for weeks or months before suitable cover material becomes available for disposal. Even then, no guarantee exists that sufficient material is available to ensure cap integrity. Consequently, contaminated material would remain available for biological interaction or uptake in violation of the free from aspects of the standards. Additionally, not all of the dredge material including capping material is subject to biological testing, consequently, the Department would have no assurance that material which has not been subjected to the full range of chemical and biological tests would not cause acute or chronic toxicity.

16. Standard 16 provides for the use of benthic invertebrate criteria where appropriate for the assessment of biological integrity. If Connecticut has developed a protocol for this biocriteria standard and criterion #13 in fresh water classes it would be useful to reference it here. I would also recommend that the first sentence be modified as follows: Benthic invertebrate criteria shall be utilized for the assessment of biological integrity and classification attainment of surface waters. This change would make standard 16 somewhat more substantive and less discretionary.
19. I suggest that standard 19 be revised to include numeric nutrient criteria for all surface waters. The recent TMDL for Long Island Sound and other water quality investigations conducted by the Department and other parties should provide a reasonable basis for the development and adoption of numeric criteria for nitrogen and phosphorous. The discretionary nature of the existing language and the lack of numeric criteria limit the effectiveness of existing standard 19 and the criteria for the designated water classifications from controlling and reversing the eutrophication syndrome of effects. I regard the development and adoption of nutrient criteria to be a much higher priority than revising the D.O. criteria downward in marine and estuarine waters.

III Surface Water Classifications

Class AA, Class A

Designated Use - The proposed language designates these waters as supporting fish and wildlife habitat and recreational use among other uses and then states that recreational use may be restricted. Missing from the designated use statement is language that clearly includes the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water. It is not at all clear that the requirement to support fish and wildlife habitat includes the requirement to provide for the protection of all life cycle stages and functions of all aquatic life and wildlife including any threatened or endangered species that would occur in surface waters. The notion that recreational uses may be restricted implies that Connecticut has adopted a hierarchical system where public water supply takes precedent over national goal uses such as the protection and propagation of fish, shellfish and wildlife and recreation in and on the water. Connecticut's designated uses need to be consistent with the national goals in section 101(a)(2) of the Act and EPA's water quality standards regulation as set forth and listed on Federal Register page 51409 of the November 8, 1983 rulemaking, 40CFR Part 131. This should be corrected in the triennial review process for all of its water classifications. I recommend expanding the designated use statement by inserting the following language after the words "fish and wildlife habitat;" on line 2: "all life cycles, processes and functions of all endemic aquatic life and wildlife;". This change needs to be made in all fresh and marine/estuarine classifications.

Parameter

2. **Dissolved Oxygen** - I recommend raising the dissolved oxygen standard in Class AA, A and B waters to protect spawning, incubation and early growth stages of both cold and warm water populations of fish and other aquatic life. For waters that support salmonids, the D.O. criteria should be not less than 7 mg/l and 75% saturation except for the period October 15 - May 15 when the 7-day mean dissolved oxygen concentration shall not be less than 9.5 mg/l and the 1-day minimum shall not be less than 8.0 mg/l. In waters where salmonids are not present, the D.O. criteria should be not less than 6.0 mg/l and 70% saturation at all times during spawning, incubation and early life stages for warm water fish and not less than 5.0 mg/l and 60% saturation all other times. In addition, daily and seasonal D.O. fluctuations above the minimum criteria should be maintained and protected to ensure that aquatic life benefit from these cyclic and periodic increases in D.O. An alternative D.O. criteria for Class AA and A waters would be as naturally occurs.
6. **Silt and sand deposits** - It is not clear why Connecticut would list a broad range of exceptions for this parameter. I would recommend using the first part of the criteria - None other than of natural origin - and delete the remainder. The excepted activities render the criteria of little value because they rely on unenforceable best management practices. Water quality criteria adopted to protect and maintain designated uses are

supposed to be enforceable measures otherwise there would be no assurance that the designated uses would be attained and protected.

11. Allowable temperature increase - I recommend that this criteria be modified. My first choice would be to delete the exception so that the criteria would be - None other than of natural origin. If Connecticut wishes to retain some form of exception then separate temperature criteria are needed for cold and warm water subclasses and the impairment demonstration needs to be expanded to include the full life cycle of fish, benthic invertebrates other aquatic life and wildlife. Fish spawning and growth are not the only sensitive life functions of aquatic life to temperature increases.
12. Chemical constituents - It is not clear if this criterion protects just the designated use of fish and wildlife habitat or if it actually is intended to protect fish and wildlife species and populations in addition to habitat. I would recommend that the designated use language be modified as suggested previously to ensure that the full life cycle of aquatic life and wildlife are adequately protected not just habitat. Alternatively, this criterion should be modified to explicitly protect all life cycles, functions and processes of all aquatic life and wildlife.
13. Benthic invertebrates - I recommend that this criterion be modified to eliminate exceptions and unnecessary subjective language as follows:

A wide variety of macroinvertebrate taxa are present, all structural and functional groups are well represented. Presence and productivity of aquatic species is as naturally occurs. Water quality and quantity shall be sufficient to sustain a diverse macroinvertebrate community of indigenous species. Taxa within the orders Plecoptera (stoneflies), Ephemeroptera (mayflies), Coleoptera (beetles), and Trichoptera (caddisflies) dominate the macroinvertebrate community in riffle and other hard bottom habitats of these waters.

Class B

My preceding comments on Class AA & A apply to Class B with the following supplements.

11. Allowable temperature increase- It is not crystal clear what is meant by the phrase "raise the normal temperature of the receiving water by more than 4° F." Is there a reason to qualify temperature by including the word normal in front of it? Where is the 4°F rise in temperature measured, at the edge of the mixing zone, at the edge of the zone of influence or at some other point? I would recommend specifying at the edge of the mixing zone.

I suggest that this criterion be revised as follows starting on line 3: "-- and in no case exceed a maximum upper limit of 68°F in waters where cold water species of fish and

invertebrates occur or 85°F in all other waters. The rise in temperature measured at the edge of a mixing zone shall not exceed 3° where cold water species occur or 4°F in all other waters.

13. Benthic invertebrates - This standard requires that all functional feeding groups shall be present in Class B waters. However, the language is much less specific about maintaining taxonomic groups since it allows for one or more to be disproportionate in abundance. Likewise, the standard allows for the pollution intolerant taxa to be diminished by some unspecified degree as a consequence of cultural factors. Does this mean that intolerant species, genera or orders can be eliminated from a section of waters due to a discharge or other activity and the water would still meet Class B criteria and standards? I recommend inserting the following sentence on line 10 of this standard as follows: No taxa present in waters upstream from a discharge or activity may be eliminated from suitable physical habitat in these waters located downstream from such discharge or activity.

Lake Trophic Classifications

As an editorial comment, I would suggest deleting the word "nuisance" as a descriptor for macrophyte beds and algae blooms. The criteria listed under each trophic category and the terms in the narrative sections such as intermittent, dense, frequent, etc. convey an adequate description without imparting a negative connotation. Many of these descriptions could also be applied to submergent and emergent wetland systems along the margins or in sections of lakes. I can see no valid reason for the state water quality standards conveying a negative message about these waters and would recommend the editorial changes suggested.

Coastal and Marine Waters, Classes & Criteria

Designated Use - SA/SB - Same comment regarding life cycle functions of aquatic life and wildlife in AA/A & B waters.

Dissolved Oxygen - The proposed criteria for offshore waters in Long Island Sound is not less than 3.5 mg/l below the seasonal pycnocline. Cumulative periods of dissolved oxygen in the 3.5-4.8 mg/l range should not exceed exposure parameters detailed in Appendix E. These criteria are based on the recent EPA draft publication on dissolved oxygen for the mid Atlantic coast region including Long Island Sound. The exposure period when D.O. is in the 3.5-4.8 mg/l range as referenced in App. E is intended to protect larval populations from greater than a 5% loss or mortality. The exposure criteria do not provide a level of protection that ensures 100% survival of larval populations, some acute (lethal) effects are allowed. In addition, this larval mortality criterion does not protect larvae from chronic effects such as growth impairment since an allowance for chronic growth effect is included in variable 3 of the model. In a somewhat similar fashion, the D.O. criterion continuous concentration (CCC) of 4.8 mg/l is intended to protect the larval growth stage of most fish and invertebrate species from sub-lethal effects. It does not ensure that all species would be protected from chronic effects of dissolved oxygen concentrations

that would limit or otherwise adversely effect growth. Consequently, the proposal to lower the D.O. criteria is not consistent with standards #12 & 14 which regulate surface waters to ensure that discharges do not cause acute or chronic toxicity or impair aquatic life. According to the EPA report, a dissolved oxygen concentration of 4.8 mg/l must be maintained to prevent chronic effects such as growth impairment in most species. Species that are more sensitive would not be protected even with the 4.8 mg/l criteria. In order for Connecticut to adopt a D.O. criterion less than 5 mg/l, additional research would need to be conducted by EPA investigators to integrate the larval growth and larval survival curves on Figure 7, page 23 of the draft D.O. document. This additional data is required to develop a single D.O. curve that protects 95% of aquatic species from adverse effects of low D.O. on larval growth and larval survival simultaneously. Consequently, the existing dissolved oxygen standard should be retained in SA waters or alternatively, adopt the SB criterion of 5 mg/l below the seasonal pycnocline to more or less maintain the status quo.

6. Silt or Sand Deposits - See comments on this parameter for Class AA, A and B.
7. Turbidity - It is not clear why the exceptions for agriculture, road maintenance, construction, dredging or discharge of dredged or fill material are included for this parameter. Also, it is not clear that BMP controls are implementable or enforceable criteria.
11. Allowable temperature Increase - See comments on Class AA, A & B regarding point of measurement and meaning of normal temperature.

Appendix A

Antidegradation Implementation Policy

II Applicability

This section does not identify that class of activities that affect streamflow, water levels in lakes and ponds or cause other hydrologic impairments as being subject to the procedures. It would seem appropriate to specifically list water withdrawals, diversions, drawdowns and certain wells as activities subject to an antidegradation review.

III High Quality Surface Waters

2. Class A, AA and SA

Suggest modifying the first sentence to read as follows: The commissioner shall not issue any certificate, permit or other approval for any discharge, dredging activity, discharge of dredged or fill material, or other activity unless he or she determines in accordance with section IV. 1) that such discharge or activity would not cause a detectable or measurable lowering of any water quality parameter of these waters.

Among other things, these proposed modifications would expand the reach of this section by eliminating the restriction to regulated discharges or activities, and by eliminating the restriction to that category of discharges or activities that cause significant changes.

Subsections (a), (b), and (c) should be deleted because it is unlikely that these activities could routinely pass the detectable or measurable change standard.

Subsection (d) could be retained and renumbered provided the second sentence (the proposed addition) is deleted in its entirety or the word "significant" on line 6 is changed to "detectable or measurable".

3) Class B and SB

The first sentence in this section is written in such a fashion that it limits the number of waterbodies that could be regarded as being high quality waters on a parameter by parameter basis. The first limitation is the requirement for a criterion listed in the standards to be exceeded. The second limitation is the requirement that all designated use goals to be met. Together, these requirements effectively limit the number of waters that could be considered as high quality. I suggest that these restrictions be removed so that a more robust application of Tier II antidegradation is possible.

Subsection (b) should be modified by deleting the word "significant" and replacing it with the words "detectable or measurable".

IV

- 1.) Determination of significant lowering of water quality- As presently constructed, the review process requires a determination of whether the activity will result in a significant change in water quality and lists a number of factors to consider in making the significance determination. This process appears to be inconsistent with the ruling in *Arkansas v. Oklahoma*, 503 U.S. ___, (1992) wherein the U. S. Supreme Court held that a reasonable threshold for antidegradation review was whether a detectable or measurable change in water quality would occur. This detectable or measurable change standard has been adopted in other case law involving antidegradation such as *Columbus & Franklin Cty. v. Shank*, 600 N. E. 2d 1042 (Ohio, 1992) where it was referred to as the no perceptible change standard.

Consequently, I would recommend that the heading be renamed as follows: Determination of detectable or measurable change in water quality. On line 3 delete the word "significant" and replace it with the words "detectable or measurable".

In subsections (a), (c) and (g) I recommend that the word "regulated" be deleted since this is an unreasonable limitation on the reach of antidegradation.

- 2.) Determination that allowing lower water quality is necessary - I would suggest changing the first sentence as follows: If the Commissioner determines that a proposed discharge or activity will result in a detectable or measurable lowering of a water quality parameter in a high quality water, he or she shall not issue a permit, certificate or other approval unless he or she finds that lowering water quality is necessary to accommodate overriding statewide economic and social development which he or she has determined is clearly in the public interest.
- (a) This subsection establishes criteria based on technology and costs from which the decision to allow lower water quality will be made. These criteria are different from those articulated by the Ohio Court in Columbus and Franklin Cty. v. Shank. There, the Court found that it was necessary to consider whether a) the discharge or activity was feasible if no degradation was allowed; b) whether the activity or development was feasible with zero discharge; and c) whether the proper area for siting the discharge or activity was evaluated. The Court indicated that the discussions and evaluations of technology were proper only after the public hearing and decision to allow lower water quality had been made. In addition, the implementation policy does not follow many of the steps outlined in the June 17, 1998 draft implementation procedure developed by EPA, Region I.
- (b) This subsection lists a number of factors that must be considered when conducting an alternatives analysis under this section. Items (iii) - (vii) include consideration of mitigation measures to presumably offset some effects of the proposed discharge or activity. Is mitigation a legitimate process/function to consider under an antidegradation review? The June 17, 1998 Region I guidance and the case law referenced in these comments do not mention mitigation as a permissible option under an antidegradation review. Therefore, I suggest that the word mitigate be deleted. I believe the word minimize would be more appropriate since it would be consistent with the requirement to demonstrate best available demonstrated control technology in this stage of the antidegradation review process.

Appendix D - Numeric Water Quality Criteria

Copper Criteria

The statewide acute and chronic copper criteria listed for freshwater are different (lower) than the current national criteria. However, the national criteria are listed for a hardness value of 100 mg/l, whereas no hardness value is listed in Appendix D. In addition, the national criteria allow for specified excursions above acute and chronic values during a three year period. Footnotes (6) and (7) for copper provide for a much greater excursion frequency above the national acute and chronic excursion values. Due to the lack of background data from which the Connecticut criteria and excursion frequencies were derived, it is not possible to compare these criteria to the national criteria. I recommend that this data be provided.

The site specific copper criterion was developed and adopted several years ago using a water effect ratio of 2.92. Now that the generic copper criterion has been adjusted downward, does the 2.92 WER get applied to the new generic or the old generic (1996) acute and chronic values for copper?

Ammonia Criteria (Table 9)

I recommend that the ammonia criteria in Table 9 be revised to be in accordance with the 1999 update for ammonia and Federal Register Notice dated December 22, 1999 (64FR 71973). Significant revisions have been made to the 1984 ammonia criteria for freshwater aquatic life which are presently included in Table 9. The acute and chronic criteria for saltwater are only listed for a pH of 8.0 and Table 9 does not mention that the national ammonia criteria varies with both temperature and pH. A similar comment applies to the freshwater ammonia criteria except that the 1999 acute value does not change with temperature however, both acute and chronic values change with pH. The reference to salmon spawning in the acute criteria should be changed to salmonids present.

Questions regarding these comments should be directed to me at 603-225-1411 or e-mail vernon_lang@fws.gov.

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